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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/607,597	06/27/2003	Du-Heon Song	8750-037	7618

7590 04/23/2004

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EXAMINER

NOVACEK, CHRISTY L

ART UNIT	PAPER NUMBER
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2822

DATE MAILED: 04/23/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/607,597

Applicant(s)

SONG, DU-HEON

Examiner

Christy L. Novacek

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) 1-12 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 13-24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 June 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

This Office Action is in response to the election filed March 15, 2004.

Election/Restrictions

Applicant's election without traverse of claims 13-24 in the paper filed March 15, 2004 is acknowledged.

Claims 1-12 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim.

Election was made **without** traverse in the paper filed March 15, 2004.

Drawings

The drawings are objected to because Figure 9B does not provide support for the limitations recited in claim 15 of the storage node contact having a longer cross-section in the second direction than the contact pad. Figure 9B shows the storage node contact and the contact pad having equal cross-sectional lengths in the second direction. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: Claim 20 recites the limitation of a cross-section of the capping layer

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being longer in the direction of the gate line than the cross-section of the bit-line in that direction.

The specification does not support this claim limitation.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 13-24 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Lines 5-6 of claim 13 recite the limitation of “etching a second inter-insulation layer to form a storage node contact exposing *a corresponding contact pad*” (emphasis added). Lines 7-8 of the claim recite “forming a contact plug in the storage node contact that is connected to *the corresponding contact pad*”. Lines 11-12 of the claim recite “etching the second inter-insulation layer to form a bit-line contact exposing *the corresponding contact pad*”. Lines 13-14 of the claim recite “forming a damascene bit-line within the bit-line pattern that is connected with *the corresponding exposed contact pad*”. Thus, it is unclear from claim 13 as to whether the storage node contact plug and the bit-line are both connected to the same contact pad or whether they are connected to two separate corresponding contact pads.

Lines 4-5 of claim 17 recite the limitation of “the insulation layer”. However, line 4 of claim 13, upon which claim 17 depends, recites “forming a second inter-insulation layer” and line 3 of claim 17 recites “forming an insulation layer”. Therefore, it is unclear as to which of these insulation layers, “the insulation layer” recited in lines 4-5 of claim 17 is referring.

For the same reasons as stated in the paragraph above, it is unclear as to which of these insulation layers, “the insulation layer” recited in line 2 of claim 18 is referring.

For the same reasons as stated in the paragraph above, it is unclear as to which of these insulation layers, “the insulation layer” recited in lines 3-4 of claim 20 is referring.

For the same reasons as stated in the paragraph above, it is unclear as to which of these insulation layers, “the insulation layer” recited in line 3 of claim 21 is referring.

For the same reasons as stated in the paragraph above, it is unclear as to which of these insulation layers, “the insulation layer” recited in lines 1, 3, 4, 5 and 6 of claim 24 is referring.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claim 13 is rejected under 35 U.S.C. 102(e) as being anticipated by Jang (US 6,436,758).

Regarding claim 13, Jang discloses providing a silicon substrate including a gate and contact pads (102/104), forming a second inter-insulation layer (106/108/110/112) on the substrate, etching the second inter-insulation layer to form a storage node contact exposing a corresponding contact pad, forming a contact plug (120) in the storage node contact that is connected to the corresponding contact pad, etching the second inter-insulation layer to form a bit-line pattern (118) with a groove shape, etching the second inter-insulation layer to form a bit-

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line contact exposing the corresponding contact pad of the contact pads, and forming a damascene bit-line (118) within the bit-line pattern that is connected with the corresponding exposed contact pad through the bit-line contact (Fig. 4A-5D; col. 3, ln. 64 – col. 5, ln. 20).

Claim 13 is rejected under 35 U.S.C. 102(e) as being anticipated by Yokoyama (US 20030232471).

Regarding claim 13, Yokoyama discloses providing a silicon substrate (1) including a gate (2) and contact pads (3/4), forming a second inter-insulation layer (11) on the substrate, etching the second inter-insulation layer to form a storage node contact exposing a corresponding contact pad, forming a contact plug (7) in the storage node contact that is connected to the corresponding contact pad, etching the second inter-insulation layer to form a bit-line pattern (8) with a groove shape, etching the second inter-insulation layer to form a bit-line contact exposing the corresponding contact pad of the contact pads, and forming a damascene bit-line (8) within the bit-line pattern that is connected with the corresponding exposed contact pad through the bit-line contact (Fig. 2-6; para. 20-24).

Claims 13 and 15 are rejected under 35 U.S.C. 102(e) as being anticipated by Park et al. (US 20020173094).

Regarding claim 13, Park discloses providing a silicon substrate (14) including a gate (12) and contact pads (50), forming a second inter-insulation layer (52) on the substrate, etching the second inter-insulation layer to form a storage node contact exposing a corresponding contact pad, forming a contact plug (60) in the storage node contact that is connected to the corresponding contact pad, etching the second inter-insulation layer to form a bit-line pattern

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(54) with a groove shape, etching the second inter-insulation layer to form a bit-line contact exposing the corresponding contact pad of the contact pads, and forming a damascene bit-line (54) within the bit-line pattern that is connected with the corresponding exposed contact pad through the bit-line contact (Fig. 7-10; para. 36-47).

Regarding claim 15, Park discloses that the contact pad and the storage node contact comprise polysilicon.


Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christy L. Novacek whose telephone number is (571) 272-1839. The examiner can normally be reached on Monday-Thursday and alternate Fridays 7:30 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian can be reached on (571) 272-1852. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

CLN
April 19, 2004


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